PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
TU04-0617W01		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/010714	28.07.2005	04.09.2003
International Patent Classification (IPC) or national classification and IPC		
Int. Cl7 C01G3/10		
Applicant		
Nikko Materials Co., Ltd.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☑ *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      ☑ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☑ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
12.01.2005	07.02.2005
Name and mailing address of the IPEA/	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/010714

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

☐ the international application in the language in which it was filed

☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rules 12.3(a) and 23.1(b))

☐ publication of the international application (Rule 12.4(a))

☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☑ the description:

pages 1-4, 6, 8 as originally filed/furnished

pages* 5, 7 received by this Authority on 12. 01. 2005

pages* _____ received by this Authority on _____

☑ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 1, 5-7 received by this Authority on 12. 01. 2005

pages* _____ received by this Authority on _____

☑ the drawings:

pages 1 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☑ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☑ the claims, Nos. 2-4, 8

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/010714

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1, 5-7	YES
	Claims		NO
Inventive step (IS)	Claims	1, 5-7	YES
	Claims		NO
Industrial applicability (IA)	Claims	1, 5-7	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

特　許　協　力　条　約

PCT

特許性に関する国際予備報告（特許協力条約第二章）

（法第１２条、法施行規則第56条）
〔ＰＣＴ３６条及びＰＣＴ規則70〕

受付印
2005. 2. 16
小越国際

出願人又は代理人の書類記号 TU04-0617W01	今後の手続きについては、様式ＰＣＴ／ＩＰＥＡ／４１６を参照すること。	
国際出願番号 ＰＣＴ／ＪＰ２００４／０１０７１４	国際出願日（日.月.年） ２８．０７．２００５	優先日（日.月.年） ０４．０９．２００３
国際特許分類（ＩＰＣ） Ｉｎｔ．Ｃｌ７ Ｃ０１Ｇ３／１０		
出願人（氏名又は名称） 株式会社 日鉱マテリアルズ		

１．この報告書は、ＰＣＴ３５条に基づきこの国際予備審査機関で作成された国際予備審査報告である。
法施行規則第57条（ＰＣＴ３６条）の規定に従い送付する。

２．この国際予備審査報告は、この表紙を含めて全部で 3 ページからなる。

３．この報告には次の附属物件も添付されている。

a [X] 附属書類は全部で 3 ページである。

[X] 補正されて、この報告の基礎とされた及び／又はこの国際予備審査機関が認めた訂正を含む明細書、請求の範囲及び／又は図面の用紙（ＰＣＴ規則70.16及び実施細則第６０７号参照）

[ ] 第Ｉ欄４．及び補充欄に示したように、出願時における国際出願の開示の範囲を超えた補正を含むものとこの国際予備審査機関が認定した差替え用紙

b [ ] 電子媒体は全部で ＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿（電子媒体の種類、数を示す）。
配列表に関する補充欄に示すように、コンピュータ読み取り可能な形式による配列表又は配列表に関連するテーブルを含む。（実施細則第８０２号参照）

４．この国際予備審査報告は、次の内容を含む。

[X] 第Ｉ欄　国際予備審査報告の基礎
[ ] 第Ⅱ欄　優先権
[ ] 第Ⅲ欄　新規性、進歩性又は産業上の利用可能性についての国際予備審査報告の不作成
[ ] 第Ⅳ欄　発明の単一性の欠如
[X] 第Ⅴ欄　ＰＣＴ３５条(2)に規定する新規性、進歩性又は産業上の利用可能性についての見解、それを裏付けるための文献及び説明
[ ] 第Ⅵ欄　ある種の引用文献
[ ] 第Ⅶ欄　国際出願の不備
[ ] 第Ⅷ欄　国際出願に対する意見

国際予備審査の請求書を受理した日 １２．０１．２００５	国際予備審査報告を作成した日 ０７．０２．２００５
名称及びあて先 日本国特許庁（ＩＰＥＡ／ＪＰ） 郵便番号１００－８９１５ 東京都千代田区霞が関三丁目４番３号	特許庁審査官（権限のある職員） ４Ｇ ９２６６ 廣野　知子 電話番号 ０３－３５８１－１１０１ 内線 ３４１６

様式ＰＣＴ／ＩＰＥＡ／４０９（表紙）（２００４年１月）

特許性に関する国際予備報告

国際出願番号　ＰＣＴ／ＪＰ２００４／０１０７１４

第Ⅰ欄　報告の基礎

1．この国際予備審査報告は、下記に示す場合を除くほか、国際出願の言語を基礎とした。

☐ この報告は、＿＿＿＿＿＿ 語による翻訳文を基礎とした。
それは、次の目的で提出された翻訳文の言語である。
☐ ＰＣＴ規則12.3及び23.1(b)にいう国際調査
☐ ＰＣＴ規則12.4にいう国際公開
☐ ＰＣＴ規則55.2又は55.3にいう国際予備審査

2．この報告は下記の出願書類を基礎とした。（法第６条（ＰＣＴ１４条）の規定に基づく命令に応答するために提出された差替え用紙は、この報告において「出願時」とし、この報告に添付していない。）

☐ 出願時の国際出願書類

☒ 明細書
第 １－４，６，８ ページ、出願時に提出されたもの
第 ５，７ ページ*、１２．０１．２００５ 付けで国際予備審査機関が受理したもの
第 ＿＿＿＿＿＿ ページ*、＿＿＿＿＿＿ 付けで国際予備審査機関が受理したもの

☒ 請求の範囲
第 ＿＿＿＿＿＿ 項、出願時に提出されたもの
第 ＿＿＿＿＿＿ 項*、ＰＣＴ１９条の規定に基づき補正されたもの
第 １，５－７ 項*、１２．０１．２００５ 付けで国際予備審査機関が受理したもの
第 ＿＿＿＿＿＿ 項*、＿＿＿＿＿＿ 付けで国際予備審査機関が受理したもの

☒ 図面
第 １ ~~ページ~~／図、出願時に提出されたもの
第 ＿＿＿＿＿＿ ページ／図*、＿＿＿＿＿＿ 付けで国際予備審査機関が受理したもの
第 ＿＿＿＿＿＿ ページ／図*、＿＿＿＿＿＿ 付けで国際予備審査機関が受理したもの

☐ 配列表又は関連するテーブル
配列表に関する補充欄を参照すること。

3．☒ 補正により、下記の書類が削除された。

☐ 明細書　第＿＿＿＿＿＿ ページ
☒ 請求の範囲　第 ２－４，８ 項
☐ 図面　第＿＿＿＿＿＿ ページ／図
☐ 配列表（具体的に記載すること）＿＿＿＿＿＿
☐ 配列表に関連するテーブル（具体的に記載すること）＿＿＿＿＿＿

4．☐ この報告は、補充欄に示したように、この報告に添付されかつ以下に示した補正が出願時における開示の範囲を超えてされたものと認められるので、その補正がされなかったものとして作成した。（ＰＣＴ規則70.2(c)）

☐ 明細書　第＿＿＿＿＿＿ ページ
☐ 請求の範囲　第＿＿＿＿＿＿ 項
☐ 図面　第＿＿＿＿＿＿ ページ／図
☐ 配列表（具体的に記載すること）＿＿＿＿＿＿
☐ 配列表に関連するテーブル（具体的に記載すること）＿＿＿＿＿＿

＊ 4．に該当する場合、その用紙に "superseded" と記入されることがある。

特許性に関する国際予備報告

国際出願番号　ＰＣＴ／ＪＰ２００４／０１０７１４

第Ⅴ欄　新規性、進歩性又は産業上の利用可能性についての法第１２条（ＰＣＴ３５条(2)）に定める見解、それを裏付ける文献及び説明

１．　見解

新規性（N）	請求の範囲	１，５－７	有
	請求の範囲		無
進歩性（ＩＳ）	請求の範囲	１，５－７	有
	請求の範囲		無
産業上の利用可能性（ＩＡ）	請求の範囲	１，５－７	有
	請求の範囲		無

２．　文献及び説明（ＰＣＴ規則70.7）

請求の範囲１，５－７に係る発明は、国際調査報告に引用されたいずれの文献にも、「不純物であるＡｇの含有量が０．０１ｗｔｐｐｍ未満、Ａｓ、Ｓｂ、Ｂｉの半金属元素の不純物がそれぞれ０．１ｗｔｐｐｍ未満、放射性元素のＵ、Ｔｈがそれぞれ０．００１ｗｔｐｐｍ未満、重金属元素のＦｅ、Ｃｒ，Ｎｉがそれぞれ０．１ｗｔｐｐｍ未満であり、かつ９９．９９ｗｔ％以上の純度を備えている高純度硫酸銅およびその製法」について記載されておらず、当業者にとって自明なものでもない。

Response to the PCT Written Opinion

1) The following opinions (1) and (2) were expressed in the Response dated November 2, 2004 issued by the PCT International Searching Authority.

(1) Claims 7 and 8 do not possess novelty and inventive step. The reason is that Documents 1 to 3 describe the manufacture of high purity copper by processes of removing impurities with activated carbon and realizing recrystallization.

(2) Although Documents 1 to 3 do not have descriptions of the numerical scope of the present invention, the refining method of Document 1 to 3 is the same as the present invention, and therefore the same results are obtained.

2) The Cited Documents 1 to 3 are as follows.

Document 1 : JP09-202619

Document 2 : JP61-83625

Document 3 : JP57-55399

3) Foremost, the amendments are explained.

Although Example 2 and Table 1 show refining effects to some degree, the refining effects are inferior when compared with Example 1 and Example 3. Thus, Example 2 is only indicated in the Description as a reference, and has been excluded from the present invention. In line with this, amendments were made to move Example 3 up to Example 2. Incidentally, the additional description of "radioactive elements of U and Th are respectively less than 0.001wtppm, heavy metal elements of Fe, Cr and Ni are respectively less than 0.1wtppm" in claim 1 relies on Table 1, and does not constitute new matter or alter the gist. Please refer to the Amendments (amendments under Article 34) filed on the same date for details.

The claims of the present application have been limited based on the foregoing amendments, and the characteristics of the present invention have become clearer. We therefore believe that the present invention possesses inventive step. The reason for this is explained in detail below. Incidentally, for the convenience of comparison with the Cited Documents, the amended independent claim 1 is once again indicated below.

(Claim 1)

High purity copper sulfate wherein the content of Ag impurities is less than 0.01wtppm, metalloid element impurities of As, Sb and Bi are respectively less than

0.1wtppm, radioactive elements of U and Th are respectively less than 0.001wtppm, heavy metal elements of Fe, Cr and Ni are respectively less than 0.1wtppm, and having a purity of 99.99wt% or higher.

4) Next, the present invention is compared with the Cited Documents 1 to 3.

Foremost, Document 1 (JP09-202619) treats waste materials such as mill ends of synthetic resin copper clad lamination, defective goods and used goods with sulfuric acid and collects the copper content as copper sulfate, and uses activated carbon during the process. Nevertheless, it is unclear as to what types of impurities are contained in the waste materials described in Document 1, and, even if activated carbon is used, the refining effect would be extremely poor.

In the present invention, the copper sulfate used as the raw material, as shown in Table 1, is commercially available copper sulfate having a prescribed level of purity (95 to 99.9%). As a result, it is possible to make "the content of Ag impurities less than 0.01wtppm, metalloid element impurities of As, Sb and Bi respectively less than 0.1wtppm, radioactive elements of U and Th respectively less than 0.001wtppm, and heavy metal elements of Fe, Cr and Ni respectively less than 0.1wtppm". Here, solvent extraction is essential. Further, a significant problem is the content of Ag. It is difficult to separate Ag from Cu, and, since they both have superior electrical conduction property, it is common technical knowledge that the idea of trying to remove Ag does not even exist.

The present invention makes the Ag content to be less than 0.01wtppm, and it would be difficult to reduce the Ag content to this level without a specific goal of reducing such Ag content to less than 0.01wtppm.

In any case, Document 1 does not disclose the use of solvent extraction, and the achievable purity is also unclear. Therefore, it would be erroneous to say that the present invention could have easily been achieved based on Document 1.

5) Next, Document 2 (JP61-83625) uses activated carbon in a part of the process of manufacturing a copper sulfate aqueous solution, and reduces antimony (Sb) and bismuth (Bi) from the copper removed slime. Nevertheless, as shown in Table 3 and Table 4 of Document 2, the extracted Cu is not even at the level of 99%. Since Document 2 is targeting low-level refining, it is not able to achieve the level of refining results obtained by the present invention as described in the comparison with Document 1 above. In addition, Document 2 does not disclose

the use of solvent extraction, or the technical spirit of trying to reduce the impurities to the level claimed in claim 1. Therefore, it would be erroneous to say that the present invention could have easily been achieved based on Document 2.

6) Next, Document 3 (JP57-55399) removes the antimony (Sb) contained in the electrolytic solution through the use of activated carbon. As with Document 1 and Document 2 described above, Document 3 does not disclose any technology for removing Ag which is usually contained in large quantities. In addition, since only active carbon treatment is the premise, it would be impossible for Document 3 with no such disclosure to yield the refining effects satisfying the conditions of claim 1.

7) As evident from the foregoing explanation, whether individually or in combination, Documents 1 to 3 provide no description relating to the constituent requirements described in claim 1 of the present invention. Further, there is no description that even suggests such constituent requirements. Therefore, it would be impossible to achieve the same effect and result of the invention of claim 1 with Documents 1 to Document 3.

Accordingly, it would be erroneous to say that the invention of claim 1 could have been easily devised based on Documents 1 to 3. Further, all claims other than claim 1 are dependent on claim 1. In other words, the dependent claims also possess inventive step as with claim 1. It is evident that the present invention possesses patentability.